



**Vraag 1**

Los op vir  $x$ :

1.1  $x^2 - 3x - 10 = 0$  (3)

$(x - 5)(x + 2) = 0$  ✓

$x = 5$  ✓ of  $x = -2$  ✓

1.2  $3x^2 - 6x + 2 = 0$  (afgerond tot twee desimale syfers) (3)

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(2)}}{2(3)}$  ✓

$x = 0,42$  ✓ of  $x = 1,58$  ✓

1.3  $4\sqrt{x + 6} = 5x - 3$  (6)

$(4\sqrt{x + 6})^2 = (5x - 3)^2$

$16(x + 6) = 25x^2 - 30x + 9$

$16x + 96$  ✓ =  $25x^2 - 30x + 9$  ✓

$0 = 25x^2 - 46x - 87$  ✓

$x = \frac{-(-46) \pm \sqrt{(-46)^2 - 4(25)(-87)}}{2(25)}$  ✓

$x = 3$  ✓ of  $x \neq \frac{-29}{25}$  ✓

1.4  $x^{\frac{1}{3}} = -2$  (1)

$x = (-2)^3 = -8$  ✓

$$1.5 \quad 5^x - 5^{x-2} = 2 \cdot (2^2 \cdot 3) \quad (4)$$

$$5^x(1 - 5^{-2})\checkmark = 24$$

$$5^x\left(\frac{24}{25}\right) = 24\checkmark$$

$$5^x = 5^2\checkmark$$

$$x = 2\checkmark$$

$$1.6 \quad (x + \sqrt{a})^2 = 2x\sqrt{a} + a + 9 \quad (3)$$

$$x^2 + 2x\sqrt{a} + a\checkmark = 2x\sqrt{a} + a + 9$$

$$x^2 = 9\checkmark$$

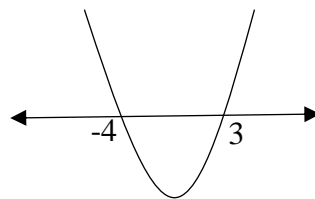
$$x = \pm 3\checkmark$$

$$1.7 \quad x(x + 1) \leq 12 \quad (4)$$

$$x^2 + x - 12 \leq 0\checkmark$$

$$(x - 3)(x + 4) \leq 0\checkmark$$

$$-4 \leq x \leq 3\checkmark \text{ grense } \checkmark \text{ notasie}$$



$$1.8 \quad \text{Los op vir } x \text{ en } y, \text{ indien:} \\ x = 3y + 1 \text{ en } x^2 - xy + 2y^2 - 17 = 0 \quad (6)$$

$$(3y + 1)^2 - y(3y + 1) + 2y^2 - 17 = 0\checkmark$$

$$9y^2 + 6y + 1 - 3y^2 - y + 2y^2 - 17 = 0$$

$$8y^2 + 5y - 16 = 0\checkmark$$

$$y = \frac{-5 \pm \sqrt{5^2 - 4(8)(-16)}}{2(8)}\checkmark$$

$$y = -1,76\checkmark \text{ of } y = 1,14\checkmark$$

$$x = -4,28 \quad \text{of} \quad x = 4,42\checkmark \text{ beide oplossings van } x$$

## VRAAG 2

2.1 Bespreek die aard van die wortels van  $3x^2 = 2x - 10$ , sonder om die vergelyking op te los. (4)

$$3x^2 - 2x + 10 = 0 \checkmark$$

$$\Delta = (-2)^2 - 4(3)(10) \checkmark$$

$$\Delta = -116 \checkmark$$

$\therefore$  Wortels is  $R' \checkmark$

2.2 Die wortels van 'n kwadratiese vergelyking word gegee as:

$$x = \frac{50 \pm \sqrt{2500 - 4p}}{240}; p \in R$$

2.2.1 Vir watter waarde(s) van  $p$  sal die vergelyking gelyke wortels hê? (2)

Vir gelyke wortels is  $\Delta = 0$

$$2500 - 4p = 0 \checkmark$$

$$2500 = 4p$$

$$p = 625 \checkmark$$

2.2.2 Vir watter waarde(s) van  $p$  sal die wortels van die vergelyking rasionaal en ongelyk wees? (2)

Vir rasionale en ongelyke wortels is  $\Delta > 0$

$$2500 - 4p > 0 \checkmark$$

$$2500 > 4p$$

$$p > 625 \checkmark$$

[8]

## VRAAG 3

Vereenvoudig:

3.1  $\sqrt{\frac{3^{5003} - 3^{5001}}{3(3^{5000})}} + 1$  (3)

$$= \sqrt{\frac{3^{5000}(3^3 - 3)}{3(3^{5000})}} + 1$$

$$= \sqrt{8 + 1}$$

$$= \sqrt{9} \checkmark$$

$$= 3 \checkmark$$

3.2  $\frac{5^{3+x} - 5^{x-1}}{25 \times 5^{x-1} + 5^x}$  (5)

$$= \frac{5^x(5^3 - 5^{-1}) \checkmark}{5^x(25 \cdot 5^{-1} + 1) \checkmark}$$

$$= \frac{624}{5} \checkmark \times \frac{1}{6} \checkmark$$

$$= \frac{104}{5} \checkmark$$

$$3.3 \quad \sqrt[4]{(\sqrt{2} - \sqrt{6})^8} \times \sqrt[4]{(\sqrt{2} + \sqrt{6})^8} \quad (4)$$

$$= \sqrt[4]{[(\sqrt{2} - \sqrt{6})(\sqrt{2} + \sqrt{6})]^8}$$

$$= \sqrt[4]{(2 - 6)^8}$$

$$= (-4)^2$$

$$= 16$$

[12]

Totaal: [50]

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